FIELD SANITATION TEAM CERTIFICATION COURSE

LESSON 12 - COLD INJURY

FSTCC0012-1

Lesson Objectives

- Define the types of cold injury.
- Select the factors that influence cold injury.
- Select the measures to prevent cold injuries.
- Determine the windchill temperature.

Introduction to Cold Injury

FSTCC0012-3

Categories of Cold Injury

Frostbite

Freezing

Frostbite – Produced by exposure to freezing temperatures

- High Altitude Frostbite

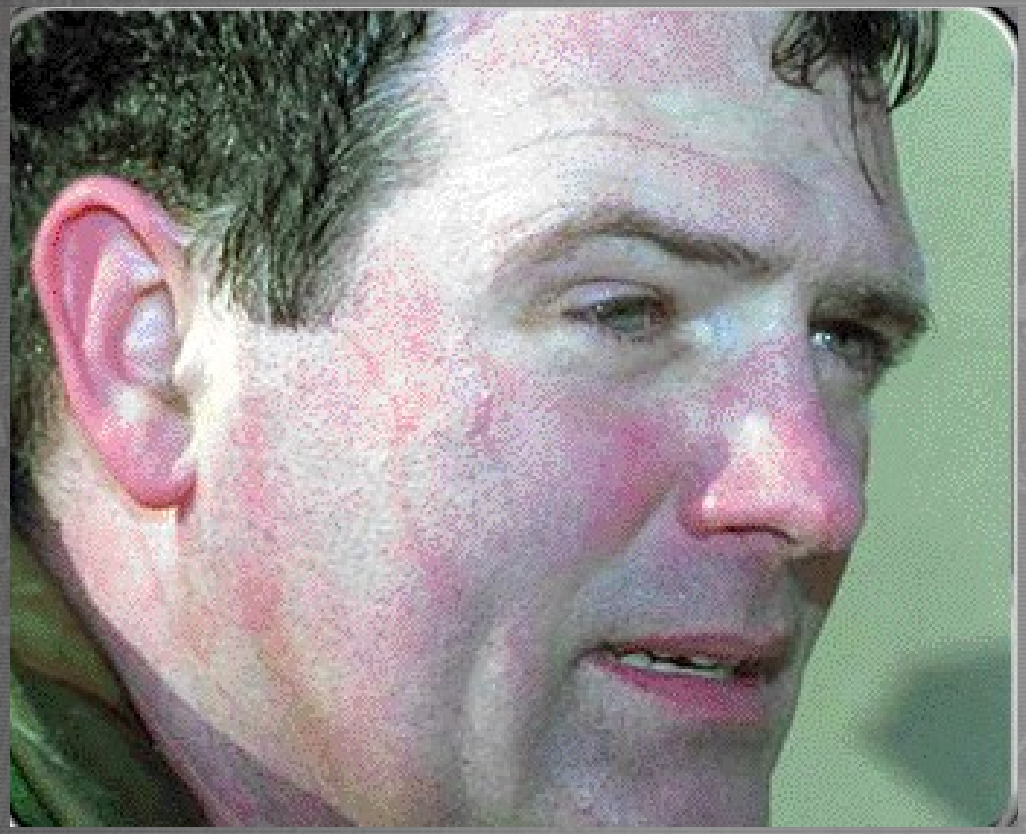
High Altitude Frostbite

Freezing

- **Frostbite**

- ***High Altitude Frostbite*** **– Produced by exposure to temperatures between -20ºF and – 80ºF at high altitudes**

Chilblain



Results from exposure to temperatures between 60ºF and 32ºF with high humidity

Non-Freezing

Chilblain (frostnip)

- Hypothermia
- Trench Foot
- Immersion Foot
- Snowblindness

Hypothermia

The body loses heat faster than it can produce it.

Fatigue and Hypothermia

Caution:

Exhaustion makes a soldier more prone to hypothermia

Trench Foot

Non-Freezing Chilblain (frostnip)

- Hypothermia
- **Trench Foot**
- Immersion Foot
- Snowblindness

Results when the feet remain cold and wet in temperatures below 50ºF for three days or more

Immersion Foot

Non-Freezing

Chilblain (frostnip)

- **Hypothermia**
- **Trench Foot**
- **Immersion Foot**
- **Snowblindness**

Results from exposure to cold water at temperatures below 50ºF in excess at 12 hours

Snow Blindness

Non-Freezing

Chilblain (frostnip)

- **Hypothermia**
- **Trench Foot**
- **Immersion Foot**
- **Snowblindness**

Results from reflection of the sun off a snow covered surface

Dehydration

***Dehydration** is a significant factor for heavy exertion missions (e.g. dismounted patrols)*

Factors That Influence Cold Injury

Agent Factors

Agent Factor

- Cold

FSTCC0012-15

Environmental Factors

Environmental Factors

Weather • Combat Action • Clothing

FSTCC0012-16

Effects of Weather

Environmental Factor

Weather

Wind - Temperature - Humidity - Precipitation

Combat Action

Environmental Factor

Combat action

Clothing Principles

- *Adequate clothing properly worn is essential to survival.*
- *Clothing for cold weather is designed to accommodate a variety of weather conditions and activity levels.*
- *Avoid skin contact with metal objects and liquid fuels.*

Host Factors

- Rank
- Previous cold injury
- Fatigue
- Discipline, training and experience
- Psychosocial factors
- Age
- Race
- Geographic origin
- Nutrition
- Activity level
- Drugs and medications

Dehydration

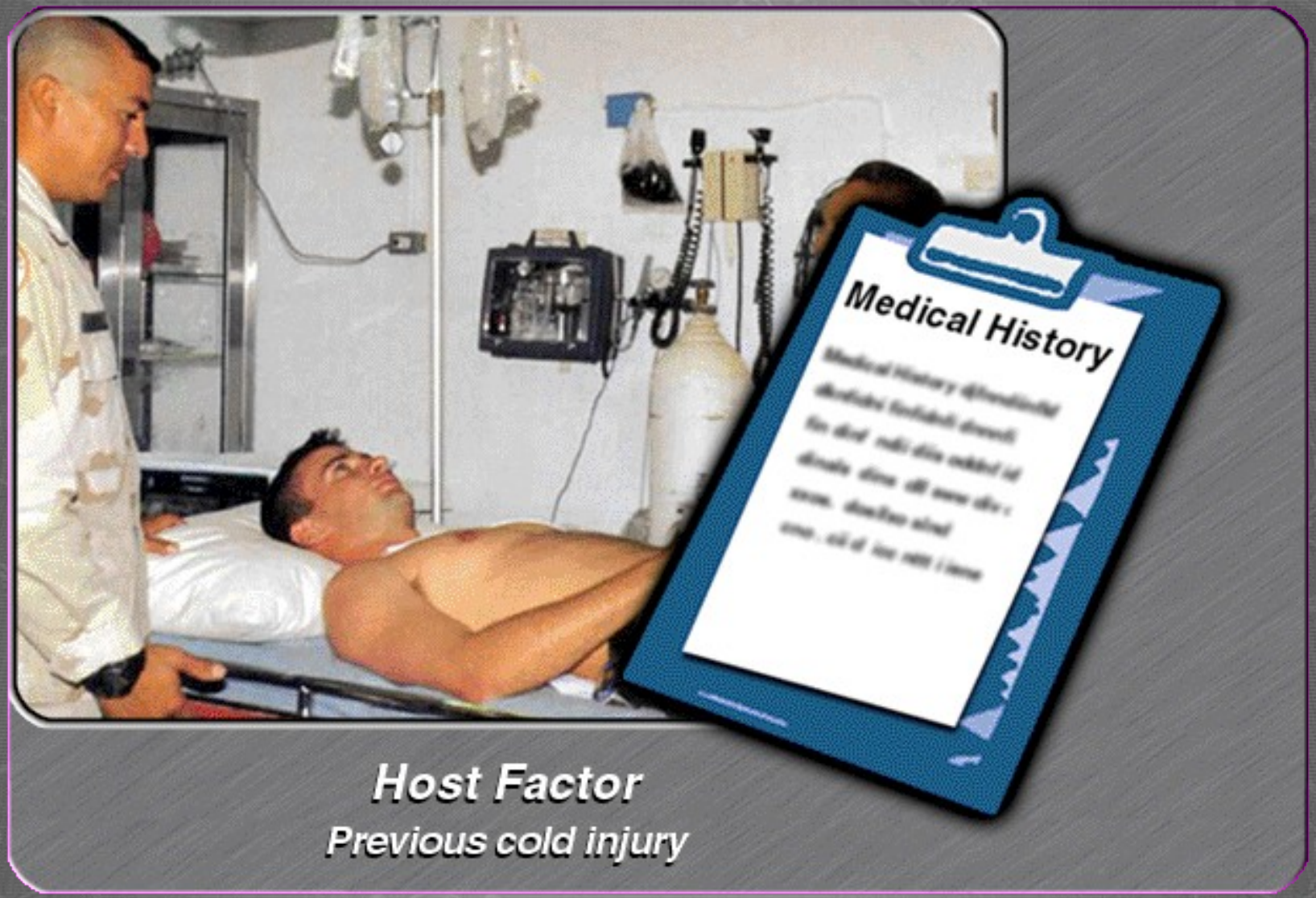
Rank

Lower ranks are more susceptible

Host Factor
Rank

Higher ranks are less susceptible

History of Cold Injury



Host Factor

Previous cold injury

Fatigue

Host Factors

Fatigue

- Causes soldiers to abandon normal personal hygiene practices
- Can be reduced with rotation of duties and personnel

Discipline, Training and Experience

Host Factors

Discipline, training, and experience

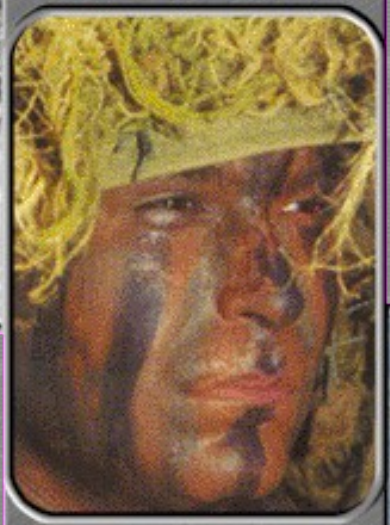
FSTCC0012-24

Age and Dehydration

Host Factor
Age and Dehydration

Psychosocial Factors

Host Factors



Psychosocial factors

Geographic Origin

Host Factor

Geographic Origin

FSTCC0012-27

Host Factor

Race

Nutrition

- ***Poor nutrition puts a soldier at higher risk.***

Nutrition

Soldiers can exist on military rations.

Activity Level

Host Factor

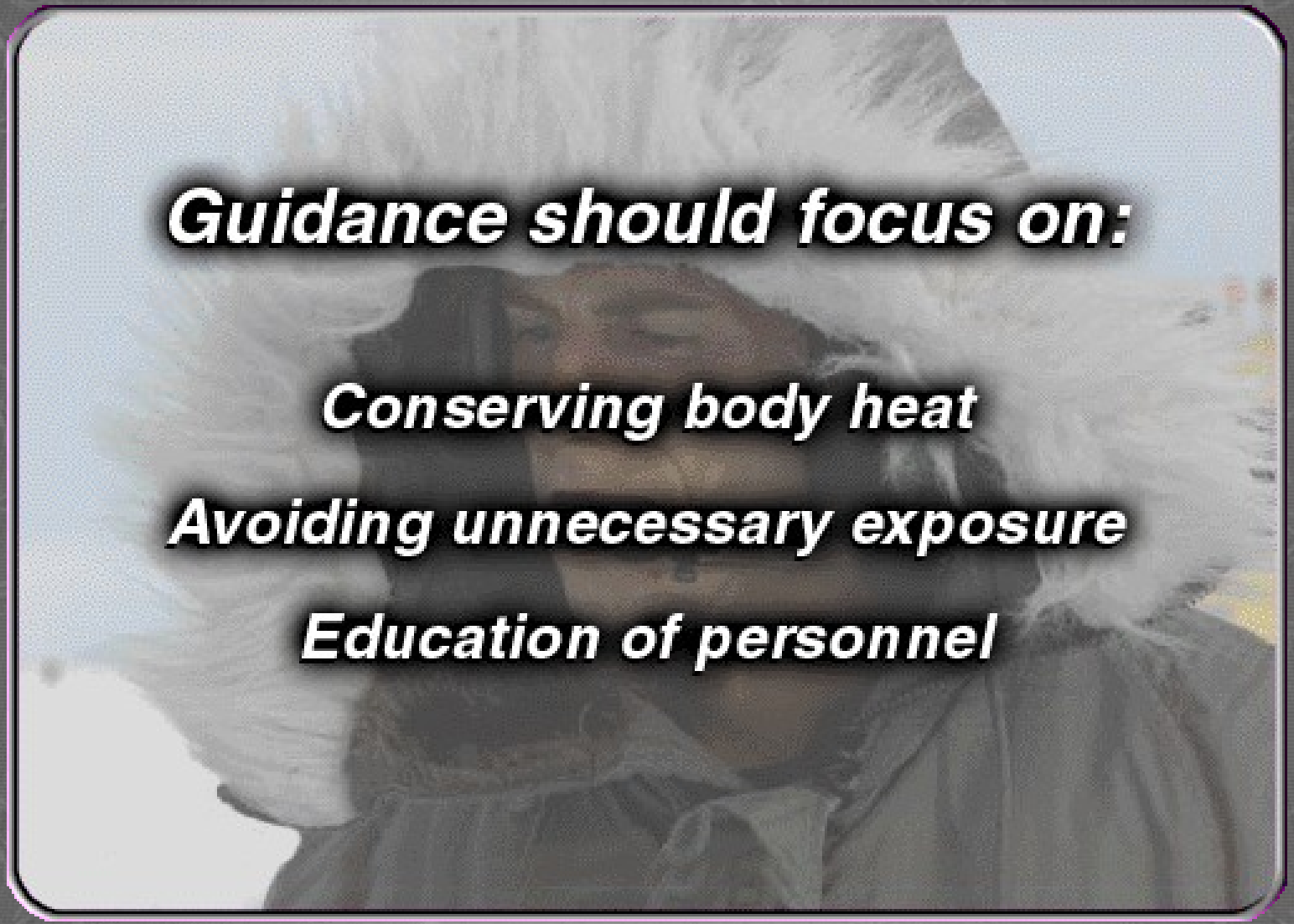
Activity Level

Drugs and Medications

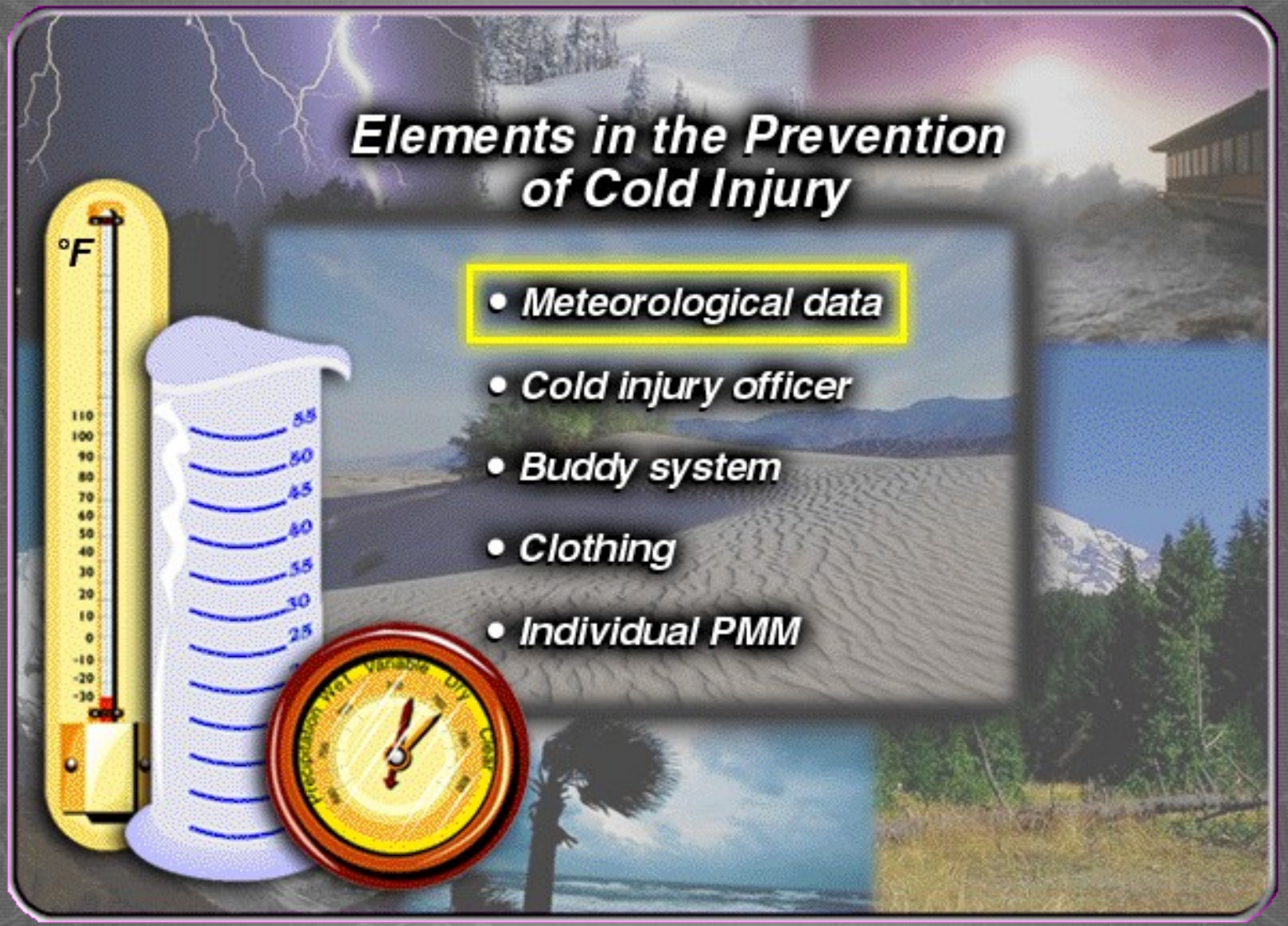
Host Factors

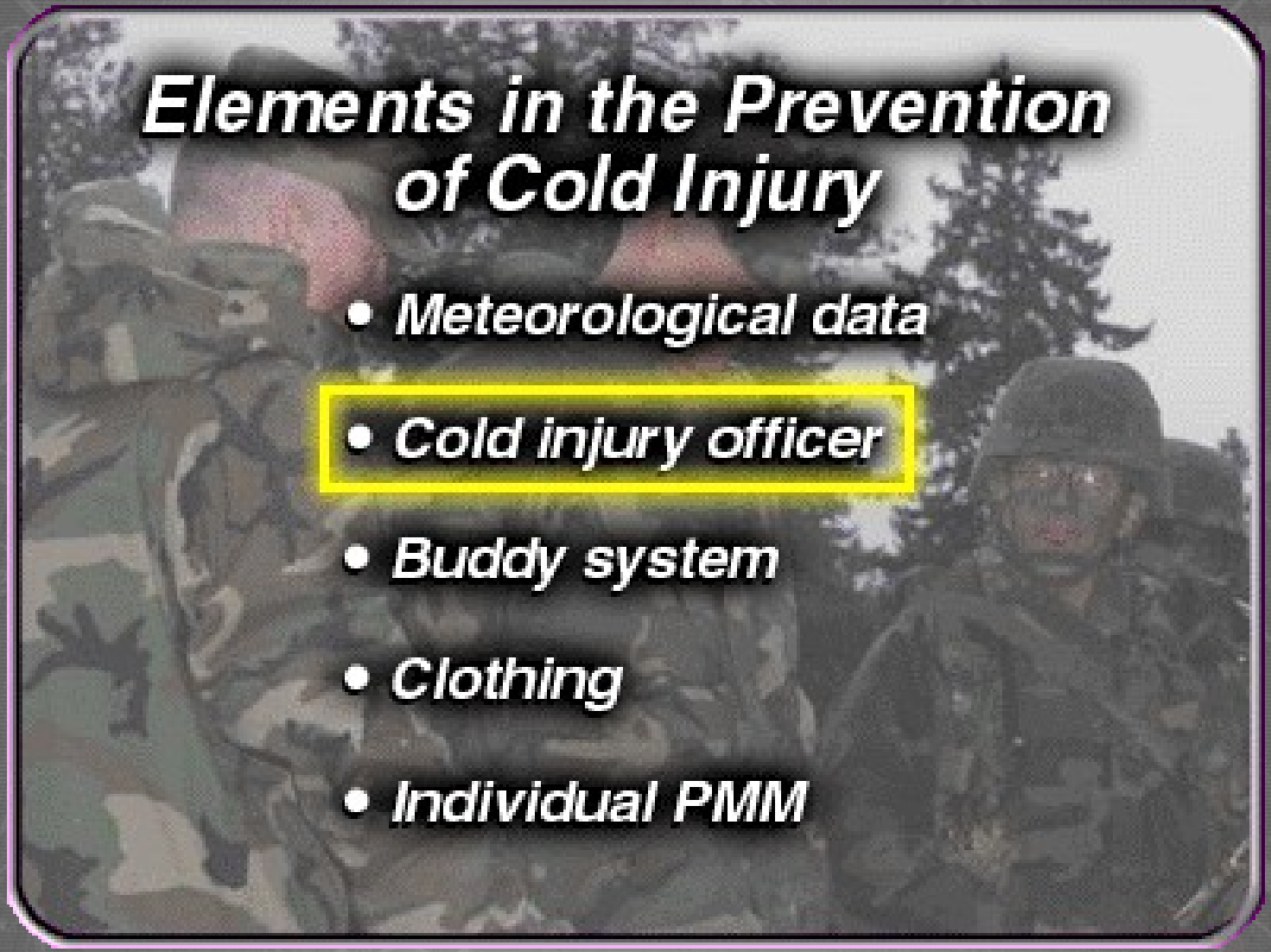
Drugs and medications

FST Role in Prevention



Using Meteorological Data




Elements in the Prevention of Cold Injury
• Meteorological data
• Cold injury officer
• Buddy system
• Clothing
• Individual PMM

The Buddy System

FSTCC0012-36

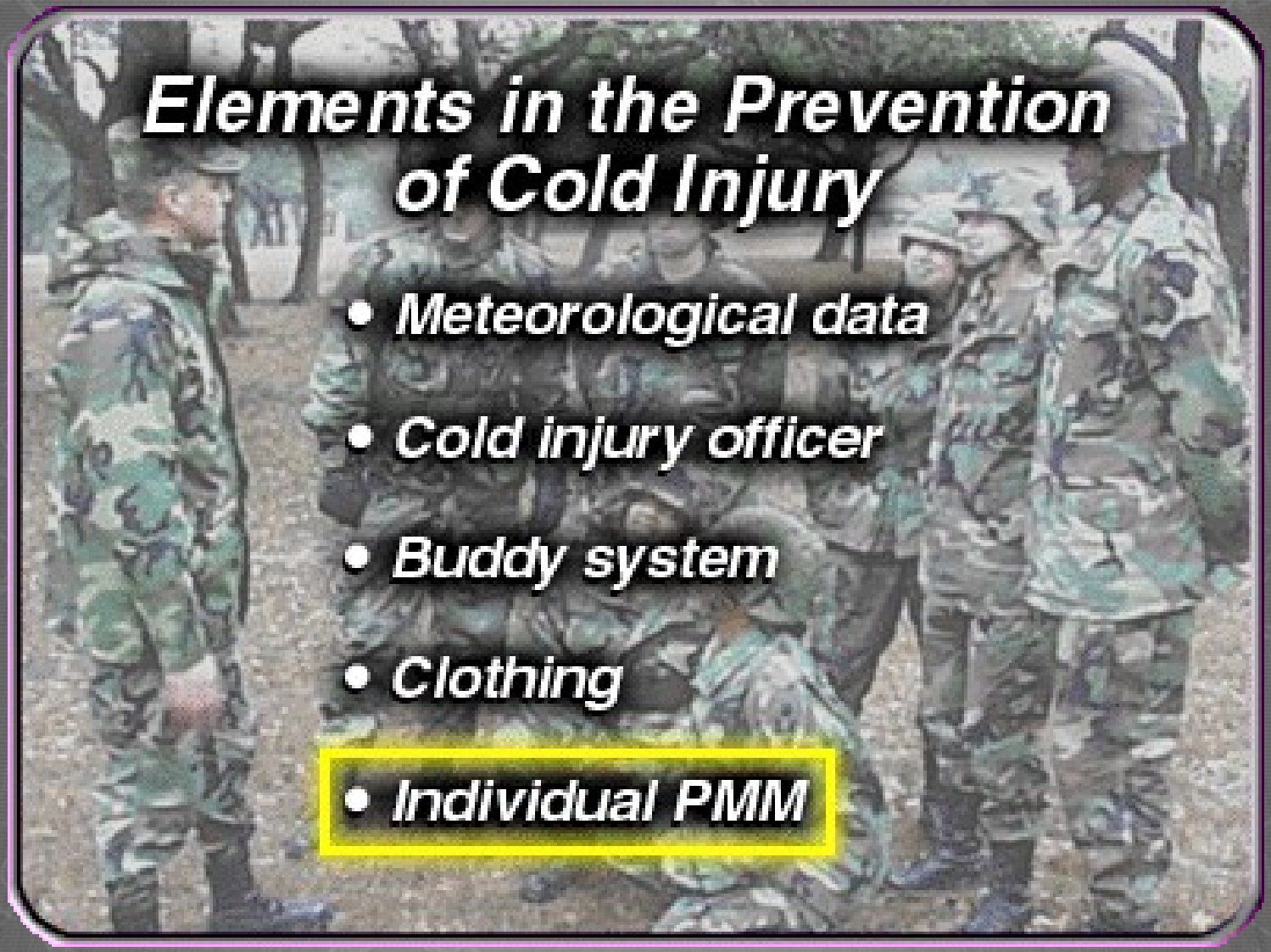
WARNING

Pay attention to the warning sings of frostbite:

You cease to feel the sensation or cold followed by a pleasant feeling of warmth.

Clothing

- Clothing should be layered.
- Clothing should be loose-fitting.
- Clothing should be clean, dry and in good condition.


Elements in the Prevention of Cold Injury
• Meteorological data
• Cold injury officer
• Buddy system
• Clothing
• Individual PMM

Wear or Carry Adequate Clothing

Wear or carry clothes that are appropriate for the anticipated weather conditions.

Benefits of Layering

Benefits of Loose-Fitting Layers
• Layers hold air between them providing extra insulation.
• Loose clothing permits good blood circulation to the extremities.
• Layering allows for the removal of excess clothing.

Protect Your Hands

- Choose mittens over gloves.
- Never touch cold objects with your bare hands.

Avoid Immobility

Protect Soldiers “At Risk”

FSTCC0012-44

Understand the Effects of Windchill

Windchill:

The effects of wind speed on chilling the body.

The Windchill Chart

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

(Wind speeds greater than 40 mph have little additional effect.)

LITTLE DANGER in less than one hour with dry skin. Maximum danger of false sense of security.

INCREASING DANGER Danger from freezing of exposed flesh within one minute.

GREAT DANGER Flesh may freeze within 30 seconds.

NOTE: 1. Trench foot and immersion foot may occur at any point on this chart.
2. F = 9/5 C + 32.

Data Along the Top of the Chart

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

(Wind speeds greater than 40 mph have little additional effect.)

LITTLE DANGER in less than one hour with dry skin. Maximum danger of false sense of security.

INCREASING DANGER Danger from freezing of exposed flesh within one minute.

GREAT DANGER Flesh may freeze within 30 seconds.

NOTE: 1. Trench foot and immersion foot may occur at any point on this chart.
2. F = 9/5 C + 32.

The windchill factor is based on air temperature and wind speed.

FSTCC0012-47

The Body of the Chart

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

(Wind speeds greater than 40 mph have little additional effect.)

LITTLE DANGER in less than one hour with dry skin. Maximum danger of false sense of security.

INCREASING DANGER Danger from freezing of exposed flesh within one minute.

GREAT DANGER Flesh may freeze within 30 seconds.

NOTE: 1. Trench foot and immersion foot may occur at any point on this chart.
2. F = 9/5 C + 32.

Determine the Windchill

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

(Wind speeds greater than 40 mph have little additional effect.)

LITTLE DANGER in less than one hour with dry skin. Maximum danger of false sense of security.

INCREASING DANGER Danger from freezing of exposed flesh within one minute.

GREAT DANGER Flesh may freeze within 30 seconds.

NOTE: 1. Trench foot and immersion foot may occur at any point on this chart.
2. $F = 9/5\ C + 32$.

SUMMARY